



Resource Adequacy Overview

Illinois Commerce Commission

Electricity Policy Committee Meeting

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Resource Adequacy

- Process of planning for the development of sufficient resources to meet actual electricity demand.
- State jurisdictional function.
- State responsibility for resource adequacy intersects with FERC's jurisdictional responsibility to ensure transmission grid reliability and just and reasonable wholesale power sales rates.
- Resource adequacy is related to, but different from, resource diversity and other policy goals.

Reserve Margin

- Planning reserve margin is an amount of supply capability above forecasted load expressed as a percentage.
- National and regional reliability organizations establish standards for planning and operating practices to ensure transmission grid reliability.
 - Includes a reserve margin recommendation (not requirement).
- PJM and MISO establish the planning reserve margin for their respective regions.
 - intended to prepare for contingencies such as unexpected outages or unforeseen increases in load.

Reserve Margin (continued)

- Calculated on the basis of loss of load expectation.
 - No more than one load outage in ten years due to inadequate supply resources.
- Reserve Margin has dual purpose.
 - Resource adequacy threshold
 - Adequate supply of electricity
 - Transmission grid reliability standard
 - Acceptable level of involuntary load shedding

Role of FERC

- Under the Federal Power Act, FERC cannot order the construction of a generator.
- FERC authority
 - Transmission grid reliability
 - Maintaining adequate generation is a key element of this function.
 - Wholesale power sales rates
- FERC cannot impose a particular reserve margin or resource adequacy level, but FERC can use its authorities to induce a level of supply resources.

Role of States

- States have ultimate responsibility for resource adequacy.
- State legislatures:
 - may choose to authorize the PUC to act in this area;
 - may choose to act on its own in this area; or
 - may choose not to act.
- To implement its resource adequacy responsibility, a state:
 - can opt to depend on the national and regional reliability standards for transmission grid reliability and FERC's wholesale markets as sufficient for resource adequacy purposes; or
 - can pursue its own resource adequacy initiatives.
- Judicial decisions specify that state initiatives cannot infringe on FERC's authority regarding transmission rates, transmission reliability, or wholesale power sales rates.

Role of the RTOs

- A principal function of RTOs is to maintain transmission grid reliability in its region.
 - requires sufficient supply resources in the right locations.
 - transmission constraints produce locational supply resource needs.
 - FERC's preference is for RTOs to employ market-based mechanisms.

Role of RTOs (continued)

- It was initially believed that the RTO's energy market (security constrained economic dispatch using locational marginal prices and single price auction clearing) would produce price signals sufficient to incent adequate resource development.
- As time passed, that market design, by itself, did not naturally produce the level of resources needed to meet planning reserve margin standards.

RTO Initiatives

- Method #1.
 - Apply a specific reserve margin to each of the entities serving load in the RTO's region.
 - capacity auction to commit supplies
 - bilateral contracting and self-supply
 - The theory underlying this approach is that the sum of revenues generated by energy, operating reserve, and capacity markets (or bilateral contracts) will be sufficient to ensure resource adequacy.
- Method #2.
 - Energy only market (name is a misnomer)
 - This technique enables energy and operating reserve prices to escalate as the level of system resources diminish.
 - Bilateral contracts and/or self-supply used as a hedge.
 - This method requires high (if temporary) energy spot prices.

Controversy Over RTO Initiatives

Upsides and downsides

- The “energy-only” market design may feature price volatility and revenue uncertainty.
- Capacity Markets are administratively complex and are also criticized for price volatility and revenue uncertainty, despite being partly designed to address those issues.

State Resource Adequacy Initiatives

- Traditionally, states relied on vertically integrated utility structures coupled with integrated resource planning processes to achieve resource adequacy.
 - IRP provides stability, predictability and continuity
 - the downside is that uneconomic investments can occur with the costs of those investments being completely borne by ratepayers.
- Regardless of their predominant industry structure, all states in regions with centralized energy spot markets must find a way to account for those regional markets in pursuing their resource adequacy strategies.

Illinois

- In 1998, the General Assembly abolished Illinois' integrated resource planning rules and initiated a process by which utilities divested generation.
 - This initiative increased Illinois' reliance on competitive wholesale power markets for resource adequacy.
- Since 1998, the General Assembly has taken action to require or incent development of certain resource types:
 - clean coal
 - renewables
 - legislated how the costs for those resources could be recovered.
- The ICC retains the PUA authority to direct utilities to build generation.

Load Always Pays

- Regardless of the method chosen to produce resource adequacy/transmission grid reliability, or the entity pursuing the initiative, load will ultimately pay.
- Payments will take different forms depending on the construct.
 - capacity markets will have explicit allocated payments
 - energy only markets will produce high spiky prices in some hours
 - traditional regulation produces high average rates
- If resource adequacy is not achieved, load will suffer the consequence in the form of involuntary service interruptions.
- State regulators' objective should be achievement of cost-effective resource adequacy/ transmission grid reliability.

Current Resource Adequacy Status

Current reserve margins in the Midwest are more than adequate.

- PJM's May 2013 capacity auction for the delivery year beginning in June 2016 produced a reserve margin of 21.1% with a price of \$59.37 per MW-day.
- MISO's capacity auction for the delivery year beginning in June 2013 cleared at a price of \$1.05 per MW-day and revealed a reserve margin of 28.1%.

Impacts of Environmental Actions

- Recent USEPA initiatives and possible future initiatives have raised concerns about high levels of unit retirements which could degrade resource adequacy.
 - MATS rule
 - CO₂ rule for existing sources
- MISO's analysis of the MATS effect (in conjunction with current and expected economic conditions) estimates that the MISO region may fall short of its reserve margin target (14.8%) for the 2016-2017 delivery year by 3,000 to 7,000 MW, which could be in the range of a 5% shortfall.

Future Possibilities

- In most product markets, resource adequacy is achieved by a price that equilibrates demand and supply.
- Currently, electric supply is responsive to wholesale market prices but much electric demand is not exposed to market prices and does not respond to market signals.
- Widespread adoption of smart meters and real time pricing may move power markets towards equilibrium and reduce the pressure for administrative resource adequacy initiatives.